



FORM PTO-1449  U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE  INFORMATION DISCLOSURE STATEMENT BY APPLICANT  (Use several sheets if necessary)	ATTY. DOCKET NO. I-2-0304.1US	SERIAL NO. 10/644,361
	APPLICANT Kwak et al.	
	FILING DATE August 20, 2003	GROUP 2661

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER							DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	AA	6	2	8	8	2	9	5	03/2001	Dogan et al.			
	AB	6	3	7	0	1	2	9	04/2002	Huang			
	AC	6	2	5	2	5	4	0	06/2001	Hale et al.			
	AD	6	1	4	4	7	1	1	11/2000	Raleigh et al.			

## FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER							DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
													YES	NO
	AE	20	02	1	3	2	6	6	04/2002	PCT				

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

AF	U.S. Publication No. 2003/0021335 A1, De et al., January 30, 2003.
AG	U.S. Publication No. 2003/0026325 A1, De et al., February 6, 2003.
AH	Anja Klein, Ghassan Kawas Kaleh and Paul Walter Baier, "Zero Forcing and Minimum Mean-Square-Error Equalization for Multiuser Detection in Code-Division Multiple-Access Channels," IEEE Transactions on Vehicular Technology, Vol. 45, No. 2, May 1996.
AI	Anja Klein, "Data Detection Algorithms Specially Designed for the Downlink of CDMA Mobile Radio Systems," IEEE 47th Vehicular Technology Conference, Phoenix, AZ, USA, May 4-7, 1997.
AJ	H.R. Karimi and N.W. Anderson, "A Novel and Efficient Solution to Block-Based Joint Detection Using Approximate Cholesky Factorization," Motorola GSM Products Division, Swindon, UK, 1998.
AK	PA Consulting Group/Racal Instruments Ltd., "Low Cost MMSE-BLE-SD Algorithm for UTRA TDD Mode Downlink," ETSI STC SMG2 Layer 1 Expert Group, Helsinki, Finland, 8-11th Sept. 1998.
AL	Anja Klein and Paul W. Baier, "Linear Unbiased Data Estimation in Mobile Radio Systems Applying CDMA," IEEE Journal on Selected Areas in Communications, Vol. 11, No. 7, Sept. 1993.

EXAMINER	DATE CONSIDERED
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/25555

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 15/00

US CL : 702/196, 340/14.1, 708/520

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 702/196, 340/14.1, 708/520

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2003/0021335 A1 (DE et al) 2003 January 30 (30.01.2003), figures 4, 5, paragraphs 37-76	1-59
Y	US 2003/0026325 A1 (DE et al) 2003 Feb. 06 (06.02.2003), figures 4, 5, paragraphs 37-86	1-59

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"I" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"Z" document member of the same patent family

Date of the actual completion of the international search

14 April 2004 (14.04.2004)

Date of mailing of the international search report

27 APR 2004

Name and mailing address of the ISA/US

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				FILING DATE August 20, 2003		GROUP 2631	
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
VP		6,208,295	03/2001	Dogan et al.			
VP		6,370,0129	04/2002	Huang			
VP		6,252,540	06/2001	Hale et al.			
VP		6,144,711	11/2000	Raleigh et al.			
VP		2003/0021335	01/2003	De et al.			
VP		2003/0026325	02/2003	De et al.			
FOREIGN PATENT DOCUMENTS							
		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES NO
		<del>02/19266</del>	<del>04/2002</del>	<del>WO</del>			<input checked="" type="checkbox"/>
VP		02/089346	11/2002	WO			
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)							
VP		Anja Klein, Ghassan Kawas Kaleh and Paul Walter Baier, "Zero Forcing and Minimum Mean-Square-Error Equalization for Multiuser Detection in Code-Division Multiple-Access Channels," IEEE Transactions on Vehicular Technology, Vol. 45, No. 2, May 1996					
VP		Anja Klein, "Data Detection Algorithms Specially Designed for the Downlink of CDMA Mobile Radio Systems," IEEE 47th Vehicular Technology Conference, Phoenix, AZ, USA, May 4-7, 1997					
VP		H.R. Karimi and N.W. Anderson, "A Novel and Efficient Solution to Block-Based Joint-Detection Using Approximate Cholesky Factorization," Motorola GSM Products Division, Swindon, UK, 1998.					

EXAMINER /Vineeta Panwalkar/	DATE CONSIDERED 11/30/2006
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VP		PA Consulting Group/Racal Instruments Ltd., "Low Cost MMSE-BLE-SD Algorithm for UTRA TDD Mode Downlink," ETSI STC SMG2 Layer 1 Expert Group, Helsinki, Finland, 8-11th Sept. 1998.
VP		Anja Klein and Paul W. Baier, "Linear Unbiased Data Estimation in Mobile Radio Systems Applying CDMA," IEEE Journal on Selected Areas in Communications, Vol. 11, No. 7, Sept. 1993.
VP	•	Vollmer et al., "Comparative Study of Joint-Detection Techniques for TD-CDMA Based Mobile Radio Systems", IEEE Journal on Selected Areas in Communications, IEEE, Vol. 19, No. 8, August 2001, pp. 1461-1475.
VP	•	Pan et al., "Low Complexity Data Detection Using Fast Fourier Transform Decomposition of Channel Correlation Matrix", 2001 IEEE Global Telecommunications Conference, Vol. 2 of 6, November 2001, pp. 1322-1326.

  

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